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(54) Title: FIREARM SAFETY LOCK			
<div style="text-align: center;"> </div>			
(57) Abstract <p>A device for disabling a gun comprising a generally cylindrical member (10) having an external diameter approximately the same as the internal bore (35) of a barrel (11) of the gun into which the device is inserted, means (10, 15; 15', 15'') to expand the member (10) over at least a part of its length into tight frictional engagement with the internal wall (35) of the barrel (11), to prevent withdrawal of the device.</p>			

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Title: Firearm safety lock

This invention relates to a device for disabling a gun, and more particularly but not exclusively, to a device for disabling a shot gun, although the device may be used to disable any gun into the barrel of which the device may be inserted.

5 By "disabling a gun" we mean that the gun is prevented from being loaded with a cartridge and hence prevented from being fired.

 According to the invention, we provide a device for disabling a gun comprising a generally cylindrical member having an external diameter approximately the same as the internal bore of a barrel of the gun into which the device is inserted, means to expand the member over at least a part of its
10 length into tight frictional engagement with the internal wall of the barrel, to prevent withdrawal of the device.

 Thus, before the barrel can be loaded with a cartridge, it is necessary to release the frictional engagement of the device with the barrel so that
15 said device can be withdrawn.

 Preferably the member is made in a plastics material such as Nylon 6 which is a relatively soft material compared with the barrel, so that upon insertion or withdrawal of the device, and as the device is expanded, there is no risk of scratching the inside surface of the barrel or otherwise damaging
20 the barrel.

 The means to expand the device may comprise an expansion element received in an internal hollow of the member, the expansion element having an engagement surface which is urged into increasingly tight engagement with an internal engagement surface of the hollow, as the expansion element
25 is rotated to expand the member. For example, the expansion element may have a screw thread, and a tapered nose portion, and the hollow of the member may have a receiving part to receive the screw thread in engagement therewith, and a tapered surface corresponding to the tapered surface of the member, whereby as the element is rotated, the tapered nose
30

portion moves along the hollow by virtue of the engaging screw thread and receiving part, into engagement with the tapered surface of the hollow to thus expand the member. The receiving part may be screw threaded to receive the screw thread of the expansion element.

5 The cylindrical member preferably has an axial through opening from one end into which the expansion element is inserted, to the other end which, in use, lies innermost of the end of the barrel into which the device is inserted, the opening at said other end of the member being too small to permit the expansion element to pass therethrough, so that as the expansion
10 element moves along the opening as it is rotated, the member adjacent said other end will be urged outwardly.

 Thus at least part of the axial through opening comprises the hollow. The member may have one or more axial slots at said other end extending from the cylindrical surface to the axial opening, to provide fingers which are
15 urged outwardly as the expansion element is rotated.

 Preferably, at least four such fingers are provided by two pairs of slits, the slits of each pair extending from the axial opening in opposite directions.

 Said other end of the member, which provides a leading end as the device is inserted into the barrel, may have a bevelled edge to facilitate
20 insertion of the device.

 The expansion element may have provided in an outermost end thereof, one or more slots or projections to engage with a tool, such as a screwdriver, to facilitate insertion and rotation of the expansion element in the through opening. Alternatively, said outermost end of the expansion element may
25 have a formation which can only be engaged by a special tool, so that the device cannot be removed from the barrel by any person not having the special tool.

 For example, the outermost end of the expansion element may have a formation such as a splined formation, which is engageable within a receiving
30 formation of a special tool to enable the expansion element to be rotated.

 The outermost end of the expansion element may have projecting longitudinally therefrom, a striking element which may be spring biased outwardly, or otherwise resilient, which striking element will enable a firing pin or hammer of the gun to be released with the disabling device in position,
35 without risk of damaging the firing pin or hammer. Thus the disabling device would more closely resemble a live cartridge.

5 Preferably the member is slightly conical. The larger diameter end may be said one end, so that the device at said one end is a tight fit in the barrel, to prevent the device moving along the barrel from the end thereof, and to hold the member as the expansion element is initially rotated against rotation relative to the barrel.

According to a second aspect of the invention, we provide a special tool for use with the device according to the first aspect of the invention, the tool comprising a shank having on one end thereof, a receiving formation to engage with the formation at said outermost end of the device.

10 The invention will now be described with the aid of the accompanying drawings, wherein:-

FIGURE 1 is an exploded perspective view of a first embodiment of a device in accordance with the invention;

15 FIGURE 2 is a cross-section through the device of Figure 1, taken on the line 2-2 of Figure 1, shown assembled and received in the end of a barrel of a shot gun.

FIGURE 3 is an end view of the device of Figure 2 in the shot gun barrel;

20 FIGURE 4 is a side view of an alternative expansion element for use in the device of Figures 1 to 3;

FIGURE 5 is a side view of a special tool for use with the element of Figure 4.

FIGURE 6 is a view similar to Figure 4 of a further expansion element for use in a device in accordance with the invention.

25 Referring to figures 1 to 3 of the drawings, a device for disabling a shot gun comprises a member 10 made of a plastics material such as Nylon 6 or any other material which is relatively soft compared with the barrel 11 of a shot gun. The member 10 has an axial through opening 12 which opens from one end 13 to the other 14, the through opening 12 receiving, in use, an expansion element 15 which when inserted into the through-opening 12 and rotated, causes the member 10 to expand, as hereinafter described.

30 The expansion element 15 comprises a generally truncated nose portion 17, a middle part 18 on which a screw thread 19 is formed, and a head portion 20 which has a receiving formation 21 for an Allen key, to facilitate rotation of the member 15. Of course, any other formation such as a projection, to engage with a special tool could be provided, or even a simple slot or slots for engagement by a screwdriver. An alternative formation comprising a

projection is shown in Figure 4 and the corresponding special tool is shown in Figure 5, described hereinafter.

5 The tapered nose portion 17 comprises an engagement surface, which engages with a corresponding engagement surface within the opening 12 of the member 10.

10 Referring particularly to Figure 2, the member 10 is shown inserted in the end of a barrel 11 of the shot gun, before the expansion element has been rotated to expand the member. It can be seen that the through-opening 12 comprises an initial section 22 having a diameter large enough to accommodate the head 20 of the expansion element 15, a female threaded receiving part 23 with which, in use, the screw thread 19 of the expansion element 15 engages so that as the element 15 is rotated, the nose portion 17 is drawn axially along the opening 12 of the member 10 into engagement with a tapered surface 24 of the opening 12 which provides the further engagement surface.

15 The section 22, receiving part 23 and tapered surface, together provide a hollow which receives the expansion element.

20 The end 14 of the member is provided with four slits 25, 26, 27 and 28 which extend from the through opening 12 to the outer cylindrical surface 30 of the member, the slits 25 to 28 thus providing four fingers 31, 32, 33 and 34.

25 As the expansion element 15 moves to the left, as seen in Figure 2, so that the nose portion 17 engages the tapered engagement surface 24 of the opening 12, the fingers 31, 32, 33 and 34 will thus be urged outwardly into tight frictional engagement with the bore 35 of the barrel 11. Thus the member 10 will be prevented from being withdrawn.

30 The member 10 which is generally cylindrical, is slightly conical having a minimum diameter at end 14, and a maximum diameter at end 13. The maximum diameter of the end 13 is preferably, the same as the internal diameter of the bore 35 of the barrel 11 so that as the member 10 is inserted, there is frictional engagement between the member 10 at end 13, and the barrel, so that the member does not slide along the barrel from the end thereof, but remains adjacent the end thereof, where the expansion element 15 is readily accessible and so that the member 10 prevents a cartridge being loaded into the barrel.

35 Further, as the expansion element 15 is initially rotated, this frictional engagement will prevent the member 10 turning in the barrel 11. The taper is exaggerated in Figure 2 for clarity.

The leading end of the nose portion 17 is bevelled as shown at B, to facilitate initial insertion of the member 10.

Referring to Figure 4, an alternative expansion element 15' is shown. This has a nose portion 17' and middle part 18' with screw thread 19' similar to the corresponding parts of the expansion element 15 of Figures 1 to 3 but the body of the element 15' is broader.

However, in place of a receiving formation in a head portion, a formation comprising a splined projection P is provided, which is adapted to be engaged by a special tool having a corresponding receiving formation.

Such a tool is shown at 40 in Figure 5, which comprises a shank 41, in one end 42 of which a receiving formation 43 corresponding to projection P is provided. The other end is provided with an opening 44 which receives a transverse bar 45 for assisting leverage.

Referring now to figure 6, a still further expansion element 15" is shown for use with a plastics member similar to member 10 shown in figures 1 to 3. Again, the expansion element 15" has a nose portion 17", a middle part 18", with a screw thread 19" similar to expansion element 15 of figures 1 to 3.

The body is slightly narrower than that of the expansion element 15 of figures 1 to 3 and has at an end 50 thereof, a splined portion P". The diameter of the portion P" is slightly narrower than the diameter of the opening 12 of the member 10 (see figure 2). Thus sufficient clearance is provided for a tool, such as that shown at 40 in figure 5, but with a suitably dimensioned and shaped internal recessing formation, to be inserted in the opening 12 of the member 10 with the splined portion P" of expansion element 15" received in a corresponding portion 43 of the tool.

The expansion element 15" has a further modification, namely a bore 51 in the end 50 thereof which extends through the splined portion P" and into the remainder of the body of member 15". The bore 51 receives a striking element 52 comprising a larger diameter part 53 received in bore 51, and a smaller diameter part 54 which projects from the end of the expansion element 15". The striking element 52 is biased outwardly by a spring 55 received in the bore 51 and is prevented from moving outwardly of the expansion element 15" beyond the position shown by a shoulder 56 between parts 53 and 54 of the element 52, and a corresponding step 57 of a bore 51.

During manufacture, the striking element 52 would be positioned by separating the splined portion P" from the remainder of the body and

thereafter releasably or permanently connecting the splined portion P" of the remainder of the body together.

If desired, instead of a spring biased striking element 52 as described, any other resilient element may be provided in the position shown. Thus when the device is received in a barrel of a gun, the firing pin or hammer of the gun can be released without risk of damage to the firing pin or hammer. Further, because the firing pin or hammer can be released without risk of damage, the disabling device with the striking element 52 would closely resemble a live cartridge in the firing action of the gun.

Many modifications are of course possible without departing from the scope of the invention.

Although as described, an expansion element 15, 15' or 15" with a screw thread 19, 19' or 19" is provided to expand the member 10 into tight frictional engagement with the barrel 11, any other means may be provided.

Furthermore, it is not essential to provide four fingers, such as the fingers 31, 32, 33 and 34, separated by slits 25, 26, 27 and 28, but more or less than four fingers may be provided.

The receiving part 23 with which the screw thread 19, 19' or 19" of the expansion element 15, 15' or 15" engages, need not itself be screw threaded, but as the material of the member 10 is soft, the screw thread 19, 19', 19" may cut its own way to provide a thread, as it is rotated.

In each case, as the material of the member 10 is soft, over-tightening will merely result in damage to the thread on the receiving part 23 and not damage to the barrel 11.

As the member 10 is generally cylindrical, and is expanded uniformly outwardly as described, there will be no tendency for the barrel 11 to distort during tightening.

It will be appreciated that the device described provides a safety device for disabling a shot gun or any other gun having a barrel into which the device may be inserted, to prevent the gun being loaded with a live cartridge, for example by children, and inadvertently fired.

The features disclosed in the foregoing description, or the accompanying drawings, expressed in their specific forms or in terms of a means for performing the disclosed function, or a method or process for attaining the disclosed result, may, separately or in any combination of such features, be utilised for realising the invention in diverse forms thereof.

CLAIMS

1. A device for disabling a gun comprising a generally cylindrical member (10) having an external diameter approximately the same as the internal bore (35) of a barrel (11) of the gun into which the device is inserted, means (10,15;15';15") to expand the member (10) over at least a part of its length into tight frictional engagement with the internal wall (35) of the barrel (11),
5 to prevent withdrawal of the device.
2. A device according to claim 1 characterised in that the means to expand the device comprise an expansion element (15;15';15") received in an internal hollow (22,23) of the member (10), the expansion element (15;15';15")
10 having an engagement surface (17) which is urged into increasingly tight engagement with an internal engagement surface of the hollow (22,23), as the expansion element (15;15';15") is rotated to expand the member (10).
3. A device according to claim 2 characterised in that the expansion element (15;15';15") has a screw thread (19;19';19") and a tapered nose portion (17;17';17") and the hollow of the member (10) has a receiving part (23) to
15 receive the screw thread (19;19';19") in engagement therewith, and a tapered surface (24) corresponding to the tapered surface (17;17';17") of the member, whereby as the element (15;15';15") is rotated, the tapered nose portion (17;17';17") moves along the hollow by virtue of the engaging screw thread (19;19';19") and receiving part (23) into engagement with the tapered surface
20 (24) of the hollow to thus expand the member (10).
4. A device according to claim 3 characterised in that the receiving part (23) is screw threaded to receive the screw thread (19;19';19") of the expansion element (15;15';15").
- 25 5. A device according to any one of claims 2 to 4 characterised in that the cylindrical member (10) has an axial through-opening (12) from one end (13) into which the expansion element (15;15';15") is inserted, to the other end (14) which, in use, lies innermost of the end of the barrel (11) into which the device is inserted, the opening (12) at said other end (14) of the member (10)

being too small to permit the expansion element (15;15';15'') to pass therethrough, so that as the expansion element (15;15';15'') moves along the opening (12) as it is rotated, the member (10) adjacent said other end (14) will be urged outwardly.

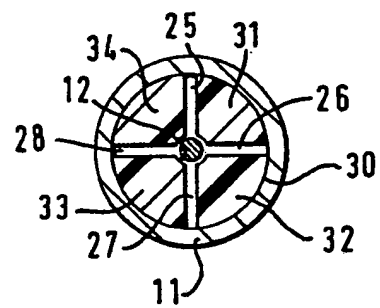
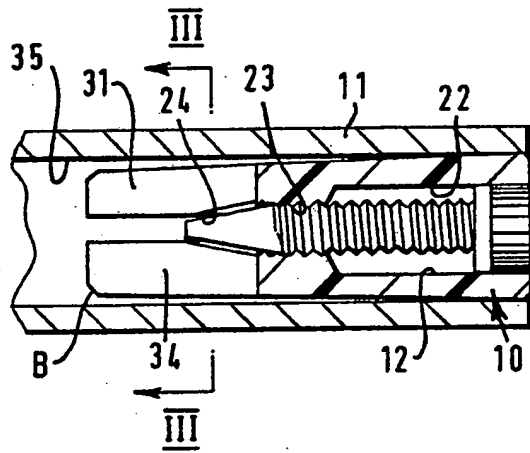
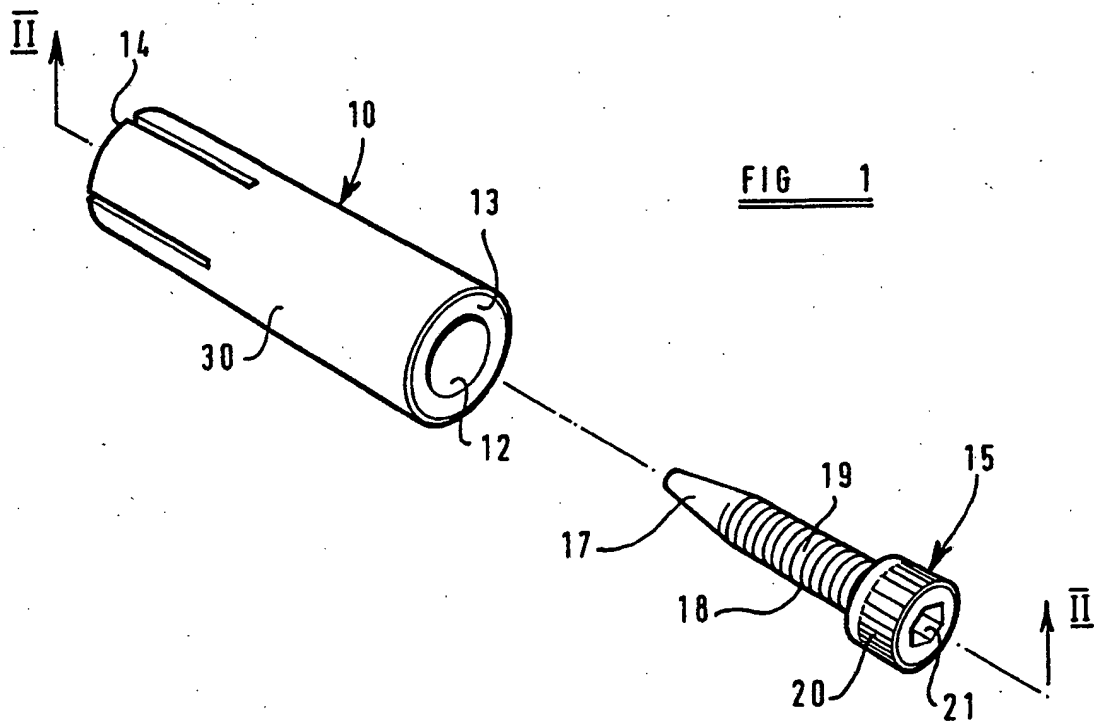
5 6. A device according to claim 5 characterised in that the member (10) has one or more axial slots (25,26,27,28) at said other end (14) extending from the cylindrical surface (30) to the axial opening (12) to provide fingers (31,32,33,34) which are urged outwardly as the expansion element (15) is rotated.

10 7. A device according to any one of claims 2 to 6 characterised in that the outermost end(50) of the expansion element (15';15'') has a formation (P;P^I) which is engageable within a receiving formation (43) of a special tool (40) to enable the expansion element (15';15'') to be rotated.

15 8. A device according to any one of claims 2 to 7 characterised in that the outermost end (50) of the expansion element (15'') has projecting longitudinally therefrom, a resilient striking element (52).

9. A device according to any one of the preceding claims characterised in that the member (10) is slightly conical.

20 10. A special tool (40) for use with the device of any one of claims 1 to 9 characterised in that the tool (40) comprises a shank (41) having on one end thereof (42), a receiving formation (43) to engage with the formation (P;P^I) at said outermost end of the expansion element (15';15'').



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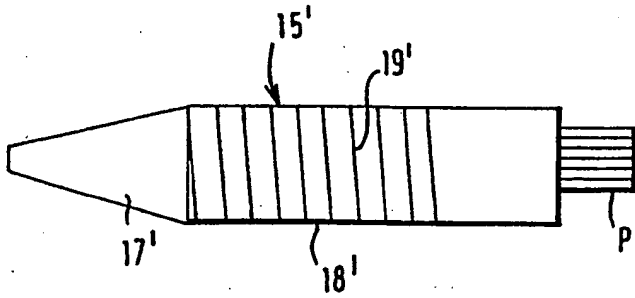


FIG 4

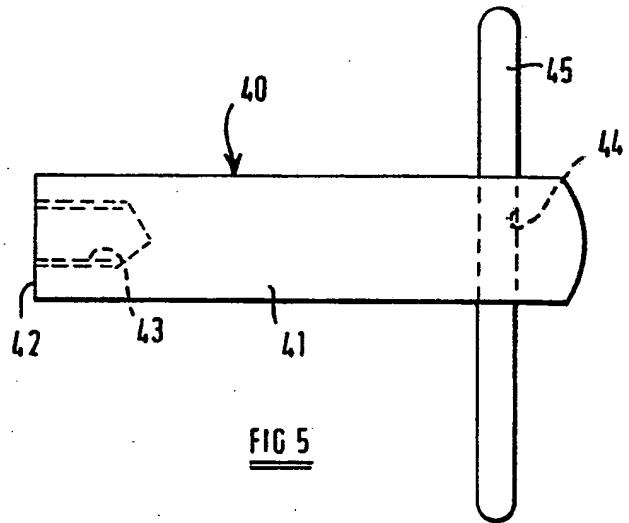


FIG 5

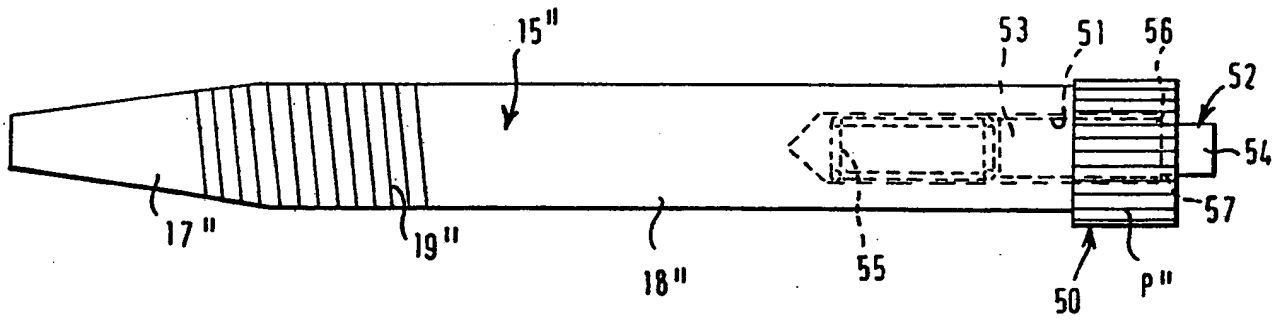


FIG 6

INTERNATIONAL SEARCH REPORT

International Application No PCT/GB 85/00238

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) *

According to International Patent Classification (IPC) or to both National Classification and IPC

IPC⁴: F 41 C 17/00

II. FIELDS SEARCHED

Minimum Documentation Searched⁷

Classification System

Classification Symbols

IPC⁴

F 41 C

Documentation Searched other than Minimum Documentation
to the extent that such Documents are included in the Fields Searched⁸

III. DOCUMENTS CONSIDERED TO BE RELEVANT⁹

Category *	Citation of Document, ¹¹ with indication, where appropriate, of the relevant passages ¹²	Relevant to Claim No. ¹³
X	US, A, 2530560 (YOUNG) 21 November 1950, see column 2, lines 15-55 and column 3, lines 1-21; figures 1-10 --	1-7,9-10
X	US, A, 3154874 (STEWART) 3 November 1964, see the whole document --	1-7,10
X	US, A, 2836918 (PULA) 3 June 1958, see the whole document -----	1-7,10

* Special categories of cited documents: ¹⁰

"A" document defining the general state of the art which is not considered to be of particular relevance

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"Z" document member of the same patent family

IV. CERTIFICATION

Date of the Actual Completion of the International Search
18th July 1985

Date of Mailing of this International Search Report

20 AOUT 1985

International Searching Authority

EUROPEAN PATENT OFFICE

Signature of Authorized Officer

G.L.M. Cruydenberg

ANNEX TO THE INTERNATIONAL SEARCH REPORT ON

INTERNATIONAL APPLICATION NO. PCT/GB 85/00238 (SA 9832)

This Annex lists the patent family members relating to the patent documents cited in the above-mentioned international search report. The members are as contained in the European Patent Office EDP file on 09/08/85

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US-A- 2530560		None	

US-A- 3154874		None	

US-A- 2836918		None	

For more details about this annex :
see Official Journal of the European Patent Office, No. 12/82